



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/084,641 | 02/27/2002 | Masaaki Ikeda | 15115.018001 | 3692 |
| 22511 | 7590 | 05/23/2005 | EXAMINER | |
| OSHA LIANG L.L.P. 1221 MCKINNEY STREET SUITE 2800 HOUSTON, TX 77010 | | | MARKHAM, WESLEY D | |
| | | ART UNIT | PAPER NUMBER | |
| | | 1762 | | |

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/084,641 | IKEDA ET AL. | |
| | Examiner | Art Unit | |
| | Wesley D. Markham | 1762 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 24 February 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5 and 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5 and 30 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 - 10) The drawing(s) filed on 27 February 2002 and 24 February 2005 is/are: a) accepted or b) objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of the amendment filed by the applicant on 2/24/2005, in which the specification of the instant application was amended, Claims 6 – 29 and 31 were canceled, one (1) replacement sheet of drawings was submitted, and an Application Data Sheet (ADS) was submitted. **Claims 1 – 5 and 30 remain pending** in U.S. Application Serial No. 10/084,641, and an Office action on the merits follows.

Oath/Declaration

2. The ADS submitted by the applicant on 2/24/2005 is noted. However, the aforementioned ADS received by the Office was missing page #2. Therefore, the ADS does not contain complete and accurate information for the instant application (10/084,641), and entry of the ADS would serve to render the record unclear. Therefore, the ADS has not been entered, and the objection to the declaration set forth in paragraph 3 of the previous Office action (i.e., the non-final Office action mailed on 9/8/2004) is maintained. The applicant is suggested to (re)submit a complete ADS having the correct foreign priority information (e.g., filing date). When such ADS is received, the objection to the declaration will be withdrawn.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) (i.e., a certified copy of Japanese priority document 2001-056693), which papers have been placed of record in the file.

Drawings

4. The objection to the drawings set forth in paragraph 5 of the previous Office action is withdrawn in light of (1) the applicant's amendment to add missing reference numbers to the specification and (2) the applicant's submission of a corrected replacement sheet of drawings depicting Figures 14A – 14C.

Specification

5. The amendment filed on 2/24/2005 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The description of reference numbers "2a" and "2b" as "pressurizing mechanisms" that rotatably hold embossment roll 3A (paragraph [0099]). Specifically, after reviewing the applicant's specification as originally filed, including the drawings, the examiner finds no disclosure (either explicit, implicit, or inherent) that would have suggested to one skilled in the art that reference numbers "2a" and "2b" are "pressurizing mechanisms". As such, the added definition of reference numbers "2a" and "2b"

Art Unit: 1762

introduces new matter into the specification. Applicant is required to cancel the new matter in the reply to this Office Action. Please note that the original disclosure adequately supports the description of "2a" and "2b" as rotatably holding embossment roll 3A (see, for example, Figure 8).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
8. Claims 1, 2, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funahata et al. (US 2002/0054259 A1) in view of Michel et al. (USPN 5,759,616), Tanaka et al. (JP 03-149803 A), and Corley (USPN 5,338,782).

9. Regarding independent **Claims 1 and 30**, Funahata et al. teaches a method for manufacturing an optical device, specifically a reflection plate (Abstract, paragraphs [0001], [0014], and [0019]), the method comprising the steps of (1) coating a substrate "1" with a resin thin layer "2", (2) drying the resin thin layer, (3) pressing a stamp "19" or "21" having an "inverted micro-asperity pattern" against the resin thin layer such that a micro-asperity pattern is formed on a surface of the resin thin layer, (4) separating the stamp from the resin thin layer, and (5) forming a reflection film "3" and an alignment film "9" on the resin layer having the micro-asperity pattern thereon (Figures 2A – 2H and 3A – 3H; paragraphs [0001], [0019], [0037] – [0043], [0053] – [0057], [0066], [0067], and [0096] – [0106]). Funahata et al. does not explicitly teach that (1) the temperature of the resin thin layer is controlled lower than a polymerization reaction starting temperature and the resin is not substantially polymerized during the coating step, (2) the resin layer is cured by heating to a temperature higher than the polymerization reaction starting temperature and the glass-transition temperature but lower than a thermal decomposition starting temperature of the resin so that the resin thin layer is polymerized on the substrate (i.e., to form a resin thin film) prior to the stamping step, and (3) the resin thin film is cooled to a temperature lower than the glass-transition temperature. However, Funahata et al. does teach that the resin is coated on the substrate by means of spinner-coating, which indicates to one of ordinary skill in the art that the resin is coated onto the substrate in a liquid form (paragraph [0097]). Michel et al. teaches that, in the art of depositing a resin layer on a substrate prior to impressing a pattern

into the layer with a molding tool (i.e., a process analogous to that of Funahata et al.), the layer is polymerized on the substrate (Col.2, lines 27 – 67, Col.3, lines 1 and 35 – 40). Therefore, it would have been obvious to one of ordinary skill in the art to control the temperature of the resin during the coating step to be lower than a polymerization reaction starting temperature because, by doing so, one would insure that the resin thin layer would be polymerized on the substrate, as taught by Michel et al., and not substantially polymerized prior to its application to the substrate. By controlling the temperature of the resin during the coating step to be lower than a polymerization reaction starting temperature and insuring that the resin is not substantially polymerized, one of ordinary skill in the art would have also reaped the benefit of insuring that the resin remains in a liquid form during the coating step, a necessity in the spin-coating process taught by Funahata et al. In other words, if the resin of Funahata et al. was applied at a temperature above the polymerization reaction starting temperature and was substantially polymerized, one of ordinary skill in the art would have expected the spin-coating process used to deposit the resin layer to be much more difficult. Regarding the curing step, Michel et al. teaches that, in the art of depositing a resin layer on a substrate prior to impressing a pattern into the layer with a molding tool (i.e., a process analogous to that of Funahata et al.), the layer is polymerized on the substrate, and the pressure and temperature at which polymerization takes place has a large influence on the strength of the layer (Col.3, lines 1 – 40). In other words, Michel et al. teaches that the temperature at which a resin layer (i.e., which is subsequently stamped) is polymerized is a result /

effective variable that determines the strength of the resulting layer. Further, Tanaka et al. teaches that it was known in the art of curing resins at the time of the applicant's invention to cure a resin at a temperature higher than the glass-transition temperature of the resin (Abstract), and Corley teaches that, when thermally curing a resin at a temperature above the glass-transition temperature of the resin, the temperature should always be lower than the temperature at which degradation of the polymer will occur at significant rates (Col.5, lines 6 – 23). Therefore, it would have been obvious to one of ordinary skill in the art to optimize the temperature at which the resin layer of Funahata et al. is cured prior to stamping (as taught by Michel et al.) as a result / effective variable through routine experimentation in order to desirably influence the strength of the resulting layer. As evidenced by the teachings of Tanaka et al. and Corley, this optimization would have been reasonably expected by one of ordinary skill in the art to include heating / curing temperatures higher than the polymerization reaction starting temperature (i.e., because such a temperature is necessary for polymerization of the layer) and the glass-transition temperature (see Tanaka et al.), but lower than the thermal decomposition starting temperature of the resin (see Corley). Regarding the cooling step, Michel et al. teaches that, after polymerization of the layer on the substrate (i.e., after forming the resin thin film), the resin thin film should be tempered and cooled at temperatures below the glass transition temperature in order to relax the film and avoid internal tensions in the film (Col.3, lines 9 – 20 and 35 – 36). Therefore, it would have been obvious to one of ordinary skill in the art to cool the resin thin film of Funahata et al.

to a temperature below the glass-transition temperature in order to relax the cured film and avoid internal tensions in the film, as taught by Michel et al. Regarding **Claim 2**, Funahata et al. also teaches that the pattern of concave and convex portions (i.e., the micro-asperity pattern) is formed on the resin film by rolling a roll-shaped pressing die “21” against the surface of the film (Figure 3A, paragraph [0103]). To make the pattern of concave and convex portions represented in Figure 3A with roll-shaped pressing die “21”, the die necessarily contacts the film a plurality of times (i.e., as it is being rolled over the surface), and as such, the “stamp is pressed against the resin thin film a plurality of times”, as required by Claim 2.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funahata et al. (US 2002/0054259 A1) in view of Michel et al. (USPN 5,759,616), Tanaka et al. (JP 03-149803 A), and Corley (USPN 5,338,782), in further view of Biebuyck et al. (USPN 5,817,242).

11. The combination of Funahata et al., Michel et al., Tanaka et al., and Corley teaches all the limitations of **Claim 3** as set forth above in paragraph 9, except for a method wherein the substrate is provided with an alignment mark thereon such that the stamp can be placed on the substrate in a manner that the alignment mark provided on the substrate matches a reference position of the stamp. However, Biebuyck et al. teaches that, in the art of stamping a pattern onto a substrate, it is desirable to provide an alignment mark “301” on the substrate so that the stamp “31” can be placed on the substrate in a manner that the alignment mark on the substrate

matches a reference position "311" on the stamp (Figure 3; Col.1, lines 3 – 5, Col.2, lines 54 – 65, Col.4, lines 13 – 25). This arrangement self-aligns the stamp with the substrate and insures that the stamp is guided into the desired final (i.e., stamping) position (Col.2, lines 54 – 59). Therefore, it would have been obvious to one of ordinary skill in the art to provide the substrate of Funahata et al. with an alignment mark thereon such that the stamp can be placed on the substrate in a manner that the alignment mark provided on the substrate matches a reference position of the stamp, as taught by Biebuyck et al., with the reasonable expectation of successfully and advantageously insuring that the stamping process of Funahata et al. produces the pattern of concave and convex portions in the specific location on the resin film desired by the purveyor in the art (i.e., due to the alignment marks), thereby increasing the accuracy and repeatability of the process.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funahata et al. (US 2002/0054259 A1) in view of Michel et al. (USPN 5,759,616), Tanaka et al. (JP 03-149803 A), and Corley (USPN 5,338,782), in further view of Yamada (JP 63-269347 A).

13. The combination of Funahata et al., Michel et al., Tanaka et al., and Corley teaches all the limitations of **Claim 4** as set forth above in paragraph 9, except for a method wherein the micro-asperity pattern is formed on the surface of the resin thin film in an inert gas atmosphere. Specifically, Funahata et al. is silent regarding the nature of the atmosphere in which the stamping is carried out. Yamada teaches that, by

carrying out a resin film stamping process in an inert gaseous atmosphere, the intrusion of air bubbles into the resin due to the stamping is prevented (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art to perform the stamping process of Funahata et al. (i.e., the process of forming the micro-asperity pattern on the surface of the resin thin film) in an inert gas atmosphere, as taught by Yamada, with the reasonable expectation of successfully and advantageously preventing air bubbles from intruding into the resin film during the stamping process.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funahata et al. (US 2002/0054259 A1) in view of Michel et al. (USPN 5,759,616), Tanaka et al. (JP 03-149803 A), and Corley (USPN 5,338,782), in further view of Ono et al. (USPN 6,075,652).
15. The combination of Funahata et al., Michel et al., Tanaka et al., and Corley teaches all the limitations of **Claim 5** as set forth above in paragraph 9, except for a method wherein the micro-asperity pattern is formed on the surface of the resin thin film in a chamber, and the pressure inside the chamber is maintained lower than atmospheric pressure. Specifically, Funahata et al. is silent regarding the pressure at which the stamping is carried out. Ono et al. teaches that, in the art of stamping a pattern into a coating, the stamping / pattern forming operation should be carried out in a vacuum chamber in order to prevent air from being entrapped in the irregularities of the stamper, which would prevent the formation of a uniform transferred surface

(Col.11, lines 62 – 67). Therefore, it would have been obvious to one of ordinary skill in the art to perform the stamping / pattern forming operation of Funahata et al. in a vacuum chamber wherein the pressure in the chamber is below atmospheric pressure with the reasonable expectation of successfully and advantageously preventing air from being entrapped in the irregularities of the stamper (i.e., due to the vacuum environment) during the stamping process, thereby improving the quality of the transferred pattern in the resin film.

Response to Arguments

16. Applicant's arguments filed on 2/24/2005 have been fully considered but they are not persuasive.
17. Regarding the 35 U.S.C. 103 rejections based on the combination(s) of references cited by the examiner, the applicant states that the manufacturing methods of the present invention advantageously prevent the resin thin film from losing its shape through softening of the resin thin film in an alignment film forming process, and none of the prior art recognizes the problems to be solved or the advantages being obtained by the present invention. In response, this argument is not convincing. To begin, please note that the purported advantages of the applicant's disclosed method(s) (e.g., that the resin thin film does not lose its shape through softening in an alignment film forming process) do not appear to have a nexus in (direct link to) the claimed invention because none of the presently pending claims recites or implies that an alignment film is formed on the resin film at a temperature that would

cause or be expected to cause softening of the resin thin film. For example, Claims 1 – 5 do not require forming an alignment film at all, and Claim 30 only generally requires forming an alignment film on the patterned resin film and does not recite or imply that the alignment film is formed at an elevated temperature (e.g., a temperature that may be expected to cause the problems noted by the applicant). Additionally, the examiner has reviewed the applicant's specification and notes that the advantages argued by the applicant do not appear to result simply from the claimed method steps, but are due to the unclaimed limitation that the resin thin film has a glass transition temperature of greater than 200° C (see paragraphs [0012] and [0016] of the specification). Please note that, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further and contrary to the applicant's assertion, the prior art does suggest the advantages of controlling a resin curing temperature as claimed by the applicant. For example, Corley teaches that, by curing monomers at or above the glass-transition temperature of the resulting polymer, optimum properties are obtained (Col.5, lines 5 – 11), and Michel et al. teaches that the temperature at which polymerization of a resin film takes place has a large influence on the strength of the layer (Col.3, lines 1 – 8) and cooling the layer to temperatures below the glass transition temperature relaxes internal tensions in the layer (Col.3, lines 9 – 18). These advantages appear to be the same as those disclosed by the applicant (see, for example, paragraph [0016] of the specification). Alternatively, the fact that applicant may have

recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

18. The applicant also argues that there is no suggestion in the cited references as to why one skilled in the art presented with the teachings of Funahata would turn to Michel, Tanaka, Corley, etc. Thus, because there is no indication *expressing desirability* to combine the teachings of the references, the references cannot properly be combined for 35 U.S.C. 103 purposes. In response, this argument is not convincing. The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law (MPEP 2144, citations omitted here for brevity). In other words, the test of obviousness is not whether one skilled in the art presented with the teachings of one reference (e.g., Funahata) would seek-out the teachings of other references (e.g., Michel, Tanaka, Corley, etc.), but rather whether or not the claimed invention would have been obvious based on what the prior art, as a whole, would have reasonably suggested to one of ordinary skill in the art. In this case, the examiner has provided a clear and convincing line of reasoning showing why one of ordinary skill in the art would have been motivated to combine the references in the manner proposed by the examiner (see paragraphs 8 – 15 above).

19. The applicant also argues that the examiner has used improper hindsight reasoning (i.e., "picking and choosing" select teachings from each reference to arrive at the claimed invention by using the present application as a template). In response to this argument, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, the examiner has clearly set forth the reasons why one of ordinary skill in the art, based on the teachings of the prior art and without aid from the applicant's specification, would have been motivated to perform the applicant's claimed process (see paragraphs 8 – 15 above). Thus, a *prima facie* case of obviousness has been made and has not been successfully rebutted by the applicant.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

Art Unit: 1762

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chen et al. (USPN 6,228,463) teaches a method comprising depositing a resin film on a substrate, curing the film by heating to a given curing temperature, and then mechanically embossing the film after (re)heating the film to a temperature sufficient to soften the film. Warashina (JP 63-042775 A) teaches depositing a resin ink having a specific glass transition temperature on a substrate, completely curing the ink by heating, and then stamping the layer with a pattern while it is heated to form a pattern on the ink layer. Pricone et al. (USPN 4,486,363) teaches that a resin film should be heated to a temperature higher than its glass transition temperature during a stamping / embossing step.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D. Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

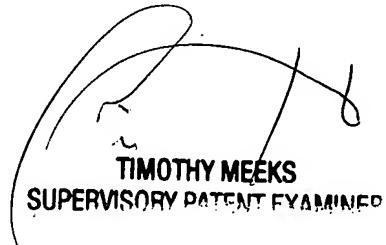
Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wesley D Markham
Examiner
Art Unit 1762



WDM



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER